



(Delhi Chapter of ISHRAE)

Indian Society of Heating Refrigerating & Air Conditioning Engineers



Delhi Chapter

I-SHARE

By Delhi Chapter of ISHRAE

Vol. XVII, Issue 2, Society Year 2025-26, Editor : Dr. Arunendra K. Tiwari, Co-editor : Tapas Kushwaha



Revolutionizing Indian Refrigeration

Driving Health, Governance, and Economic Supremacy



South Asia's Premier Refrigeration & Cold-Chain Exhibition

GOLD PARTNERS



SILVER PARTNERS



BRONZE PARTNERS





A MOVEMENT OF ACCELERATING CLIMATE ACTION FOR A NET ZERO FUTURE

4th October 2025

VENUE: LE MÉRIDIEN, CONNAUGHT PLACE, NEW DELHI

KEY ATTRactions



Renewable energy



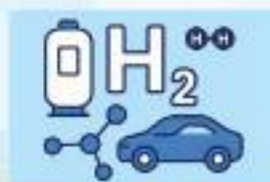
Decarbonization



Waste Management



Climate Finance



Hydrocarbon



Water Conservation



Panel Discussion



Call for paper



Awards & Felications



Climate Journal

PRESENTING PARTNER



Climate Partner



IAQ Partner



Booth Partners

Decarbonization Partner



Registration Partner



RSVP



Mr. Ravi Shankar Kumar
RD North - 1, Ishrae



Mr. Sandeep Goel
Chair Technical



Mr. Waliullah Siddiqui
DCI President



Mr. Ashish K Jain
Chairman



Mr. Azhar Abdullah
Chair Partnership



Dr. Ruchi Grover
Chair Innovation



Ms. Sukhda Tandon
Chair Marketing & Co-Chair Planning



Ms. Sheeba Siddiqui
Chair Planning



Mr. Robin Chauhan
Chair Delegate

SCAN For
REGISTRATION



ISHRAE Members Participation
fees @ INR 1000
Non - Member Participation
fees @ INR 1500

Supporting Associations



For more details

9205780208, 9205780211, 7982623229

E: info@dcishrae.org | admin@dcishrae.org | executive.secretary@dcishrae.org

www.climatesummit.co.in

PRESIDENTIAL ADDRESS

Dear ISHRAE Members,

Greetings from Delhi Chapter of ISHRAE (DCI),

It gives me immense pleasure to connect with you again thru **second edition of I-SHARE** and I am grateful to all the ISHRAE members of Delhi chapter for their wholehearted dedication and support.

In the second quarter of this society year, we have achieved 100% of the chapter programs targets, be it Distinguished Lectures, Full day workshops, Half day workshops, ITDs, IKTs, IECs, Refrigeration programs and national programs.

Our two exclusive full day workshops were done on the request of CPWD Chief Engineer dated 17-18 July at their **National CPWD Academy**, Kamla Nehru Nagar -Ghaziabad. It was done under knowledge collaboration with government officials and advocacy & "ISHRAE at your DWAR" with a membership drive which was well accepted and appreciated with attendance of over 65 CPWD Senior Engineers in two days.

Another workshop was done at GMR-IGI Airport on "**Life safety and MEP- NBC and Global Codes**" was a big success and attended by 60 Engineers and technicians from DIAL and GMR.

Our total chapter strength is now of 1810 active members, making DCI distinguishing itself as one of the largest chapter. In this society year we have achieved 115 new membership and 95 renewals as I write this which is 58% of our annual chapter new membership targets. This could be achieved due to overwhelming support and enthusiasm of Industry participants in our programs.

We have already installed five student chapters with active student strength of 135 this year and aggressively doing student engagement and internship programs which are being carried out at each of these colleges. On K-12 front We have done several programs on Environmental awareness, nation building, cleanliness, waste recycling and Energy saving to children and youngsters.

We did national program **REFCON 2025** at Delhi as a pre-invitation to **REFCOLD 2025** on 22nd August Evening at Crowne Plaza Mayur Vihar which was also supported by our **Meerut Sub-chapter** and attracted veteran and leaders from government bodies like NCCD, Refrigeration and Cold chain Industries with more than 100 people in attendance.

Road shows and curtain raiser events at Agra, Chandigarh, Ludhiana and Jalandhar were successfully organized with HQ for advocacy and publicity of **REFCOLD 2025**.

This I-share edition is an exclusive edition on Refrigeration and cold chain systems and businesses as its launch is in sync with the inauguration of 8th edition of **REFCOLD INDIA 2025 -South Asia's Premier Refrigeration and Cold Chain Exhibition** being held at Bharat Mandapam (Pragati Maidan) New Delhi from 18th September to 20th September which DCI is proudly hosting under the theme of "**Revolutionizing Indian Refrigeration – Driving Health Governance and Economic Supremacy**".

In line with the government policy and priorities for Refrigeration and cold chain systems, ISHRAE has collaborated with Industries in this flagship refrigeration and cold chain exhibition.

The safety, quality and efficacy of perishable goods like, food, pharmaceuticals, fruits, vegetables, dairy products, fisheries and other sensitive products is important and can be achieved by maintaining a consistent low temperature from production to consumption. The importance lies in significantly reducing food waste and spoilage, preventing the growth of harmful microorganisms, extending product shelf life, ensuring consumer safety, and also allowing access to wider markets for businesses. We will discuss and showcase technologies for these in this exhibition.

Entire DCI (Delhi Chapter of ISHRAE) CWC will be there as host chapter at **REFCOLD 2025** to help you have a wonderful visit to this exhibition.

I also take this opportunity to Invite you to our **Annual General Meeting (AGM)** being held at India Habitat centre (IHC) **Juniper Hall** on 27th September 2025, from 7:30 PM onwards. Along with this We want to invite you for the CLIMATE SUMMIT, N.D. on 4th October 2025 at Le meridian, N.D.

I Would like to extend my heartfelt gratitude to all our partners ALP Aeroflex, Advance Valves, The Refrigeration House, Belimo, Zeco, Bosch, K-Flex, Avantec, Truestar & Greenoz.

Please feel free to share your feedback and thoughts at my personal e mail ID wsiddiqui21@yahoo.com or at my WhatsApp number 9810450857. I shall be more than happy to interact.

Best Regards

Waliullah Siddiqui
President (S.Y. 2025 – 26)
Delhi Chapter of ISHRAE



Revolutionizing Indian Refrigeration: Driving Health, Governance, and Economic Supremacy

By: Samta Bajaj



India, a country of over 1.4 billion people, is on the threshold of a major transformation in how it feeds, heals, and governs its citizens. While the spotlight is often on digital technologies, renewable energy, or space exploration, one silent but powerful revolution is happening closer to home: refrigeration. Far from being just about cooling milk or keeping vegetables fresh, refrigeration in India is evolving into a strategic enabler of public health, efficient governance, and economic supremacy.

This article explores how refrigeration, once a luxury, is becoming a pillar of modern India's progress.

1. The Silent Backbone of Public Health

Healthcare delivery in India is often evaluated in terms of hospitals, doctors, and medicines. However, an overlooked but essential component is the "cold chain."

- **Vaccines and Medicines:** The COVID-19 pandemic underscored the importance of reliable cold storage. Vaccines, especially mRNA-based ones, needed ultra-low temperature storage. Without robust refrigeration, the vaccination drive for millions would have faltered. Going forward, India's universal immunization program, which annually protects 27 million children and 30 million pregnant women, depends heavily on refrigeration infrastructure across the remotest villages.

- **Blood and Organ Storage:** Refrigeration enables the safe storage of blood, plasma, and even organs for transplantation. With road and air transport networks improving, a reliable cold chain ensures that lifesaving biological material doesn't perish before reaching patients.
- **Nutrition and Food Safety:** Malnutrition continues to be a challenge in India. Refrigeration of perishable foods like milk, fruits, vegetables, and fish ensures not only longer shelf life but also higher nutritional retention. Cold storage prevents contamination and spoilage, directly impacting child health and maternal care.

In essence, refrigeration is not just an appliance—it is a life-saving infrastructure.

2. Governance Through Cooling Infrastructure

Governance today is increasingly about delivering services efficiently, transparently, and inclusively. Refrigeration is quietly enabling this in several ways.

- **Food Security and PDS:** India operates one of the largest public distribution systems (PDS) in the world. Traditionally, grain storage has been the focus, but with changing dietary patterns, perishable items like milk, vegetables, and frozen foods are also entering the supply chain. Cold storage ensures that subsidies reach people without losses to spoilage, pilferage, or adulteration.



**PRECISE
CHILLED WATER SOLUTIONS
FOR THE HIGH-TECH INDUSTRY**



BUTTERFLY VALVES

High Performance
Double Offset

Resilient Seated
Concentric

INDUSTRY

Data Centers

Semiconductor
Manufacturing

Renewable Energy

Electronic
Manufacturing

- **Disaster Management:** Whether during heatwaves, floods, or cyclones, refrigerated transport of essentials like drinking water pouches, ready-to-eat meals, and medicines becomes vital. Governance resilience depends on such infrastructure being available at scale.
- **Digital Governance Synergy:** The "Digital India" movement is complemented by smart refrigeration. IoT-enabled cold chains allow real-time monitoring of temperatures, reducing corruption and inefficiencies in logistics. For instance, a refrigerated truck carrying vaccines can now be tracked on an app, ensuring accountability from warehouse to clinic.

Refrigeration, when integrated with governance, becomes a powerful tool for trust-building between citizens and the state.

3. Refrigeration as an Economic Multiplier

India loses nearly 30–40% of its perishable produce due to inadequate cold storage and logistics. This translates into billions of dollars lost annually, affecting both farmers and consumers. Revolutionizing refrigeration offers a pathway to economic supremacy.

- **Agriculture and Farmer Prosperity:** With 55% of India's workforce engaged in agriculture, refrigeration can stabilize prices and reduce distress sales. For example, tomatoes or onions often rot before reaching markets, causing farmers to sell at throwaway rates. Cold chains ensure that farmers can store and release produce strategically, improving income security.
- **Food Processing Industry:** India's \$600 billion food and grocery market is ripe for transformation. Refrigeration enables scaling up frozen food production, dairy processing, meat exports, and ready-to-eat meals—all high-margin sectors. This strengthens India's position in global trade.
- **Employment Generation:** Cold chains create jobs in manufacturing, installation, logistics, retail, and maintenance. Skilled refrigeration technicians are in high demand, creating opportunities for youth across semi-urban and rural areas.
- **Export Competitiveness:** As India eyes leadership in global food exports, reliable refrigeration assures importing nations of quality and safety. From mangoes to seafood, a strong cold chain network boosts India's credibility in international markets.

Thus, refrigeration is not just about cooling—it is about catalyzing a trillion-dollar economy.

4. The Green Refrigeration Imperative

As India modernizes, it faces the paradox of growth versus sustainability. Refrigeration consumes energy and often uses refrigerants with high global warming potential (GWP). To balance economic supremacy with environmental responsibility, green refrigeration must take center stage.

- **Energy Efficiency:** Transitioning to energy-efficient compressors, variable speed drives, and thermal storage systems reduces electricity consumption. Solar-powered refrigeration is increasingly viable in rural India.
- **Natural Refrigerants:** India is gradually moving away from hydrofluorocarbons (HFCs) towards eco-friendly refrigerants like ammonia, carbon dioxide, and hydrocarbons. This aligns with India's commitments under the Kigali Amendment to the Montreal Protocol.
- **Circular Economy:** Recycling old refrigeration units, creating sustainable cold storage infrastructure, and reducing food waste via cold chains together contribute to climate goals.

Green refrigeration ensures that India's cooling revolution is not only economically viable but also environmentally responsible.

5. Refrigeration and India's Global Standing

India's rise as a global power depends not only on military strength or digital innovation but also on its ability to guarantee health, food security, and economic resilience. Refrigeration ties all these elements together.

- **Health Diplomacy:** By exporting vaccines, biologics, and food safely through robust cold chains, India strengthens its soft power. The "Vaccine Maitri" initiative during COVID-19 is a case in point.
- **Leadership in Cooling Innovation:** Indian startups and companies are increasingly developing low-cost, solar-powered refrigeration for rural areas. By exporting these solutions to Africa and Southeast Asia, India positions itself as a global leader in affordable cooling.
- **Economic Diplomacy:** As global demand for safe and sustainable food supply chains grows, India's refrigeration-enabled agribusiness exports become a driver of foreign exchange and geopolitical influence.

In short, refrigeration is emerging as an unlikely but powerful instrument of global leadership.

6. Challenges and The Road Ahead

Despite its promise, India's refrigeration sector faces hurdles:

- **Infrastructure Gaps:** Current cold storage capacity is heavily skewed towards a few states and commodities like potatoes. A more diversified, regionally balanced cold chain is required.
- **High Costs:** Refrigeration infrastructure demands capital investment, often unaffordable for small farmers or traders.

- **Skill Shortage:** A lack of trained technicians hampers maintenance and efficiency.
- **Energy Dependency:** Refrigeration's heavy reliance on electricity poses challenges in areas with unreliable supply.

To overcome these, policy support, public-private partnerships, and grassroots innovation will be critical. The government's "Pradhan Mantri Kisan SAMPADA Yojana" and initiatives under the National Centre for Cold-chain Development (NCCD) are steps in the right direction.

Conclusion

Refrigeration in India is no longer about luxury appliances humming in urban kitchens. It is about vaccines reaching tribal villages, farmers securing fair prices, governments building trust through efficiency, and India asserting itself as an economic and geopolitical powerhouse.

By embracing green, inclusive, and technologically advanced refrigeration, India can simultaneously safeguard health, strengthen governance, and unlock economic supremacy. The cooling revolution, if executed with vision, will not just preserve food—it will preserve India's future.



Author

Ms. Samta Bajaj

Knowledge & Training Chair (ICP/IEC)

Samta Bajaj is a seasoned HVAC professional with 35 years experience in HVAC industry including 11 years in Blue Star Ltd. She is B. E (Mechanical); "Delhi College of Engineering" and pursued SMP from "IIM Ahmedabad". Her MEP consultancy Firm "ENVIROCON" has provided design services for + 1500 projects in diverse applications Active Member of ISHRAE ; Presently Knowledge & Training Chair (ICP/IEC)



THE REFRIGERATION HOUSE

SIEMENS



kamstrup



Honeywell



WIKAL



SANT



VALUE

VALUE Creates Value



COPELAND



BELIMO



Johnson Controls



Future-Ready HVAC and Refrigeration: Mechatronic Control Systems for Efficiency and Sustainability

By: Dr. Hemant Naik and Dr. Neeraj Kumar Bhoi

Introduction

Heating, ventilation, air conditioning and refrigeration (HVAC&R) is a contemporary field with a history that spans over a century and shaped modern life in ways that often remain unnoticed. From the 19th century, the mechanical refrigerators provided and is still considered a game changer in food preservation methods. The evolution of cooling technologies has always been vital to the growth of industries and the well-being of communities. The same is true in India, where these technologies have helped in the protection of food crops in the supply chain, the establishment of sterile hospitals, enhancing the comfort of workplaces, schools, and homes, and improving overall efficiency. Still, all of this relies greatly on expensive energy, has a considerable negative impact on the environment, or both. The traditional HVAC&R systems remain to this day one of the highest consumers of electricity in buildings and industries, and the use of refrigerants with a high global warming potential worsens the situation. Today, the need for change is stronger than it has ever been. Rapid urban growth coupled with increasing wealth in India has drastically changed the demand for cooling equipment, and is expected to peak the pressure on electricity supply. If this is not resolved, energy security and climate commitments will be in jeopardy, especially India's target of achieving net-zero emissions by 2070. At the same time, the inefficacy of food cold chains causes considerable post-harvest waste, endangering food security and economic balance. Clearly, the existing systems are incapable of meeting the dual requirements of productivity and ecological balance.

In this regard, the adoption of Mechatronic Control Systems (MCS) represents a major shift. MCS is reinventing HVAC&R into a smart grid by intelligent sensing and flexible actuation, AI-driven predictive control, and secure inter-machine communication metamorphosing energy intensive machines into intelligent grid-ecosystems. These systems reduce emissions from energy and refrigerants, provide demand flexibility, enable predictive maintenance, and enhance long-term resilience, making India the epicenter of the shift toward sustainable cooling.

The Need for Transformation

The cooling industry in India is at a very strategic junction. The increasing demand, the old systems, and the growing environmental pressure require a fast transition

of the traditional HVAC&R to intelligent, mechatronic based solutions. The change has ceased to be an option, but an economic, environmental and social requirement. The major forces of change are depicted below:

- Increasing energy consumption: HVAC&R already comprise close to 40 percent of energy usage in the Indian commercial sector [1]. This proportion will only increase with no efficiency improvements, a factor that can destabilize the grid in India and increase the price of electricity.
- Food cold chain inefficiencies: Post-harvest losses of 1520 per cent in fruits and vegetables, estimated to cost more than 50,000 crore every year (NABARD, 2023), are the result of ineffectively operated refrigeration systems. Smarter cold chains play an important role in the income of farmers and the food security of the country [2].
- Inefficiency in the traditional systems: Manual controls, nonvariable-speed compressors, and no adaptive load matching are all unwarranted wastages of energy. Predictive mechatronic controllers can reduce the consumption by 25-35% directly reducing the operation cost [3].
- Reliability and maintenance lapses: The traditional systems are based on reactive maintenance, which usually results in downtime of 10-12 hours per annum. This can be cut by half with predictive fault detection that is AI-enabled, which ensures comfort and storage without interruption [4].
- Alignment with national priorities: The national cooling action plan (NCAP, 2019), part of the smart cities mission, promotes sustainable, efficient, and intelligent cooling. Mechatronic control systems are ideally suited to advance these policy objectives and drive India's net zero efforts [5].

Mechatronic Control Systems in HVAC and Refrigeration

Mechatronic control systems are changing the face of HVAC&R to the future of its application through an integrated system that incorporates the key elements of adaptive sensing, smart actuation, predictive control and more secure communication. Unlike traditional HVAC&R systems that rely heavily on fixed-speed operation and manual intervention, mechatronic HVAC&R systems see intelligent sensors used to measure a wide range of

TRUST BUILD ON
CERTIFIED
PERFORMANCE



CERTIFICATIONS THAT DEFINE EXCELLENCE



ISO 9001:2015 Certified by TUV SUD underscores our commitment to quality management systems, ensuring operational excellence at every stage.



AHRI Certified Heat Exchanger Coils (Standard 410) ensures optimal thermal performance and energy efficiency.



AHRI Certified Casing (Standard 1350) guarantees industry-leading leakage performance and durability.



CE Marking - A testament to our compliance with European safety, health, and environmental protection requirements.

PRODUCT RANGE

- SMART AIR HANDLING UNITS
- AIR HANDLING UNITS (Horizontal / Vertical)
- CEILING SUSPENDED UNITS
- FAN COIL UNITS (PSC / BLDC Motor)
- AIR WASHERS (Single / Multi-Stage)
- AIR SCRUBBERS (Wet / Dry type)
- VENTILATION & EXHAUST UNITS
- ENERGY RECOVERY UNITS

AVANTEC AIRCON PRIVATE LIMITED

Manufacturing Works : Bahadurgarh (Haryana)

Sales & Service Network : • Delhi • Haryana • Ahmedabad • Mumbai • Hyderabad • Bengaluru

sales@avantec.co.in | www.avantec.co.in | Ph : 011-45650714

real-time variables including temperature, humidity, airflow, and air quality. Using these real-time variables, embedded controllers and AI-driven algorithms can accurately control compressors, fans, and valves, optimizing energy efficiency while providing comfort and safety [6].

Variable speed drives allow both compressors and fans to respond automatically based on system load, leading to reductions in power consumption of up to 30% [7]. AI-led predictive maintenance mechanisms allow faults to be identified earlier to decrease downtime by about 50% versus traditional systems. In addition, IoT-enabled dashboards provide facility managers with high-resolution visibility into consumption patterns compared to efficiency to drive proactive management decisions.

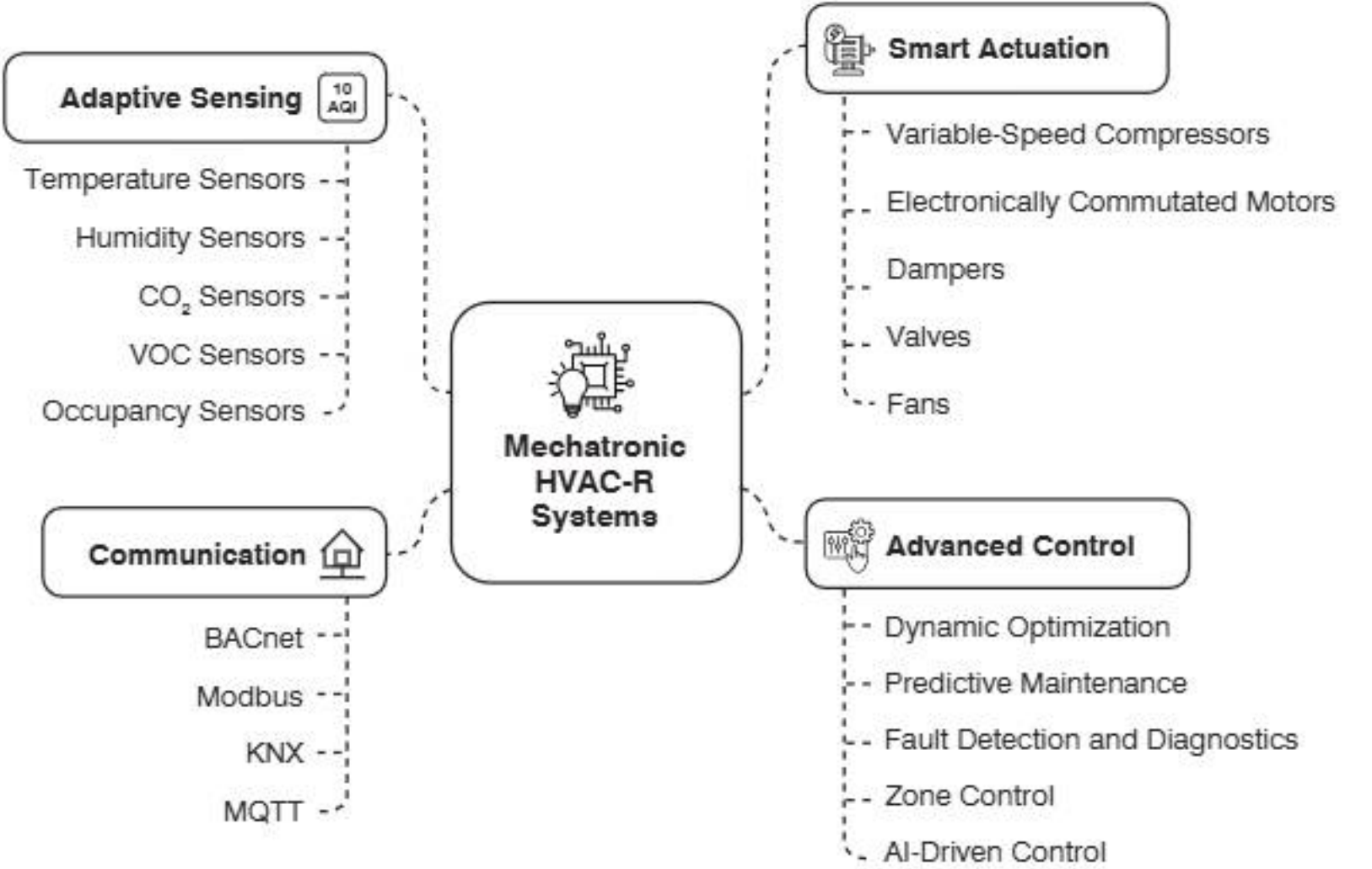


Figure 1: Comparative impact of mechatronic controls on HVAC and refrigeration systems

The benefits to the evidence are in Figure 1, which shows the comparative influence of advanced MCS deployment in HVAC&R systems. With mechatronic integration, systems achieve 25–35% energy savings, extended lifespan (from 10 years to 12–15 years), reduced downtime (from 10–12 hours/year to 4–5 hours/year), and 20–30% lower carbon footprints [6]. These advantages are further reinforced in Table 1, where mechatronic HVAC&R consistently outperforms conventional systems across parameters such as energy efficiency, reliability, environmental sustainability, and grid integration. For example, while conventional systems depend on thermostatic on/off control, MCS employ predictive and adaptive algorithms for precise temperature and humidity regulation. Similarly, demand-controlled ventilation ensures healthier indoor air quality while cutting energy waste.



INTEGRITY | INNOVATION | EXCELLENCE



Multi Stage Cooling Unit



Air Handling Unit (AHU)



Industrial Air Cooler



Air Scrubber Unit



Air Washer



Fan Coil Unit



Coiling Suspended Unit



Polymer Plate Heat Exchanger



Tube Axial Fan

**LEADING
MANUFACTURER
OF
AIR TREATMENT &
AIR DISTRIBUTION
SYSTEMS**



GREENOZ COOLING SYSTEM PVT. LTD.



HEAD OFFICE:

Unit #1-J-63 & Unit #2-I-138, Site-C (UPSIDC)
Industrial Area, Surajpur, Greater Noida,
Gautam Budh Nagar - 201306 (U.P.) India

SALES OFFICE OKHLA:

ALT Building 101, NH-19,
Ishwar Nagar, Okhla,
New Delhi - 110044

SALES OFFICE INDORE (M.P.):

94-A, Vaishno Vihar Colony,
Near Scheme No. 51/155,
Power Grid Indore (M.P.) India - 452006

SALES OFFICE ANDHRA PRADESH:

H No: 3-7, 2nd/3rd Floor, Opposite
Anand Residency, Jampet, Rajahmundry
East Godavari (Dist) Andhra Pradesh - 533103

Mob.: +91 9319995818, +91 9319993918 | E-mail: info@greevent.com, gvs.sales1@gmail.com | Website www.greenozcooling.com

Table 1: Comparative impact of conventional and mechatronic controls on HVAC and refrigeration systems

Parameter	Conventional System	With Mechatronic Controls
Energy savings	Baseline	25–35%
System life span	10 years avg.	12–15 years
Downtime	10–12 hrs/year	4–5 hrs/year
Carbon footprint reduction	–	20–30%

By seamlessly merging mechanical, electronic, and digital intelligence, MCS transform HVAC&R into intelligent, future-ready infrastructures, perfectly aligned with India's sustainability and net-zero ambitions.

Aligning with India's Sustainability Goals

Mechatronic HVAC&R systems play a central role in the process of transitioning India to a sustainable development and net-zero emissions. These systems help in more directly articulating national policy for intelligent sensing, adaptive management, and optimization with AI. Key benefits are summarized below:

- **Energy productivity:** MCS means much more intelligent control avoiding unnecessary electricity waste, leading to better BEE star ratings for businesses and less pressure on the grid [8].
- **Improved cold chain:** Better refrigeration efficiency translates into a reduction in post-harvest loss of 15 to 20% and better food security and rural income.
- **Health and comfort:** Consistency in air quality and complete control of humidity means wellness for people in hospitals, subways, and intelligent campuses where secure and functional spaces have always been essential.
- **Economic growth:** For system from 235 to 350 TR Annual cost reductions of 2-3 lakh for 100 TR systems foster increased competition and lower emissions.

Advanced Applications of Mechatronic HVAC and Refrigeration Systems

The proposition of mechatronic control systems has changed from being an abstract idea into a concrete driver of real change in critical industries. They enable the release of applications that previously were hard to go with in traditional HVAC&R systems while permitting application of AI, IoT and adaptive control. The main applications are

- **Green data centers:** The use of AI-controlled refrigerants to precisely cool lowers power usage effectiveness, lowers carbon footprint, and provides uninterrupted IT operations.

- **Smart hospitals:** Adaptive mechatronic control systems keep the air sterile, humidity under control and patient comfortable, and reduce energy waste in sensitive healthcare settings.
- **Agro-refrigeration hub:** Cold chains powered with IoT that are linked to renewable microgrids eliminate post-harvest losses, enhance food security, and increase rural income.
- **Urban campuses/factories:** Construction of automation platforms together with predictive HVAC controls will offer personalized comfort, efficiency in energy usage, and easy integration of renewables.
- **Urban metro and transport systems:** Smart ventilation and climate control systems maximize comfort and control indoor air quality (IAQ) of high volume transit areas, as well as minimize operational costs.

Table 2 shows clearly that mechatronic systems are superior when comparing conventional HVAC and Mechatronics HVAC&R based on various performance parameters. The traditional systems use fixed speed compressors and simple thermostatic controls, whereas mechatronic use variable speed drives, predictive algorithms and fuzzy logic controllers to optimize the load, control the humidity and provide smooth operation [9, 10]. Reliability is also achieved, because predictive fault detection saves down time significantly as compared to reactive maintenance in traditional system. Moreover, the demand-controlled ventilation enhances IAQ, and when combined with smart grids allows load shifting and use of renewable energy. Mechatronic HVAC&R systems are better even in such areas as lifecycle costs and cybersecurity. Condition-based maintenance is a predictive approach, which pushes the lifespan of the systems, whereas strong IoT connectivity and safe communication protocols guarantee the optimization of the performance and cyber resilience.

Table 2: Comparative advantages of mechatronic V/s conventional HVAC and refrigeration systems across performance parameters

Challenge	Normal / Conventional HVAC&R	Mechatronics-based HVAC&R
Energy efficiency	Fixed-speed compressors and fans → high energy wastage during part-load conditions.	Variable speed drives, adaptive control, and predictive algorithms → optimize load, reduce energy consumption.
Temperature and humidity control	Basic thermostatic on/off control → frequent cycling, poor humidity regulation.	PID, fuzzy logic, and MPC enable precise thermal comfort, adaptive humidity control, and smooth operation.
System reliability	Reactive maintenance → failures often detected after breakdown; high downtime.	Embedded fault detection and diagnostics + predictive maintenance → early detection, minimal downtime.
Environmental sustainability	Uses high-GWP refrigerants, poor monitoring of leaks → higher emissions.	Smart sensors for refrigerant monitoring, eco-friendly refrigerant optimization, leak detection and control.
Ventilation and air quality	Manual/constant ventilation → risk of over/under-ventilation, wasted energy.	Demand-controlled ventilation using CO ₂ /VOC sensors → optimized IAQ with energy savings.
User comfort and adaptability	One-size-fits-all comfort → discomfort in varying occupancy or dynamic climate.	Personalized, occupancy-based zoning with AI → human-centric comfort and adaptive microclimates.
Integration with renewables and smart grid	Limited or no integration with solar/waste heat; cannot respond to grid signals.	Smart grid-ready, integrates renewables, performs load shifting and demand response.
Lifecycle and maintainability	Shorter equipment life due to overuse, wear and tear → higher lifecycle cost.	Predictive and condition-based maintenance extends life, modular upgrades enable sustainability.
Data and connectivity	Minimal sensing, manual control, no IoT connectivity.	IoT-enabled sensors, cloud analytics, digital twins for performance optimization.
Cybersecurity	Not network-connected → less risk, but also no digital intelligence.	Connected to IoT/Smart grids → risk of cyber attacks, but mitigated with secure communication protocols.

Towards Large-Scale Adoption: Challenges, Opportunities, and Policy Support

Mechatronic HVAC&R systems in India have both great opportunities and urgent challenges that should be adopted. On one side of the equation, the sector is expected to grow fivefold in cooling requirements by 2050 (IEA, 2023), which will be a considerable market opportunity for smart and energy-efficient solutions. Mechatronic controls can reduce energy use by 25-35 percent, extend system life 15 years, and reduce operational downtime by almost 50 percent, with clear advantages to operations. These benefits provide direct support to ocean action plan (2019) where India envisions delivering sustainable, affordable, and climate-resilient cooling for all. Long-term payoffs are discouraged by the high initial cost of many small and

medium enterprises. AI- and IoT-enabled systems cannot be successfully deployed without a skilled technical workforce, yet, the modern capacity building activities are minimal. Besides, the implementation of IoT increases the threat of cybersecurity, which requires safe communications and legal frameworks. Unstable power supply, and lack of awareness also hamper rural adoption, particularly in cold chains.

India has a solid policy support on the opportunity side through the smart cities mission, BEE star-rating programmes, and incentives on low GWP refrigerants. Through the concerted action of industry, academia, and government, India can make HVAC&R one pillar in its energy efficiency and sustainability strategy, and generate employment and international leadership in smart cooling.

Conclusion

The cooling industry in India is in a pivotal stage of discarding the old machinery that consumes much energy and shifting to intelligent mechatronic ecosystems that can impetus sustainability, resilience, and competitiveness. Mechatronic HVAC&R systems deliver revolutionary effects by integrating AI, IoT, and automation into agro-cold chains and fisheries, data centers and district cooling: the reduction of energy intensity, the prevention of refrigerant leakage, and the maintenance of stable and reliable comfort.

Table 3 will show mechatronic HVAC&R India strategic the process by which this change will occur in the next

several decades. Digital retrofitting of existing systems in the near term (2025-2030) can unlock 20 percent of energy savings in the commercial sector, and can generate quick and low-cost payoffs. The undeniable integration of AI-controlled autonomous HVAC systems will result in a 30 to 40 percent decrease in the volume of cooling-related emissions, which directly underlines the national cooling action plan and the net-zero commitments in India. With a full switch to a net-zero aligned smart factories, hospitals, and cities by 2040-2070, India will become a leader in sustainable innovation in refrigeration and HVAC systems around the globe [11].

Table 3: Strategic roadmap for mechatronic HVAC and refrigeration in India (2025-2070)

Phase	Focus Area	Expected Outcomes
2025–2030	Digital retrofitting in existing systems	20% energy savings across commercial sector
2030–2040	AI-driven autonomous HVAC systems	30–40% reduction in cooling-related emissions
2040–2070	Net-zero aligned smart factories, hospitals, and cities	Sustainable, resilient India with global refrigeration leadership

This planned approach shows that mechatronic systems are technically achievable and can be aligned with the national energy objectives. It is possible to accelerate the adoption of mechatronic systems at a faster pace, just as endorsements of appropriate policies, programs, incentives, and skills development will turn saved kilowatt-hours into emissions avoided, jobs created and economic security established.

References

1. Sharma, M., Chaturvedi, V. and Purohit, P., 2017. Long-term carbon dioxide and hydrofluorocarbon emissions from commercial space cooling and refrigeration in India: a detailed analysis within an integrated assessment modelling framework. *Climatic Change*, 143(3), pp.503-517.

2. Sidhu, R.S., 2025. Advancing Sustainable Growth in Indian Agriculture: Integrating Technology, Market and Policy Frameworks. *Indian Journal of Agricultural Economics*, 80(1), pp.1-37.

3. Ryalat, M., Franco, E., Elmoaqet, H., Almtireen, N. and Al-Refai, G., 2024. The integration of advanced mechatronic systems into industry 4.0 for smart manufacturing. *Sustainability*, 16(19), p.8504.

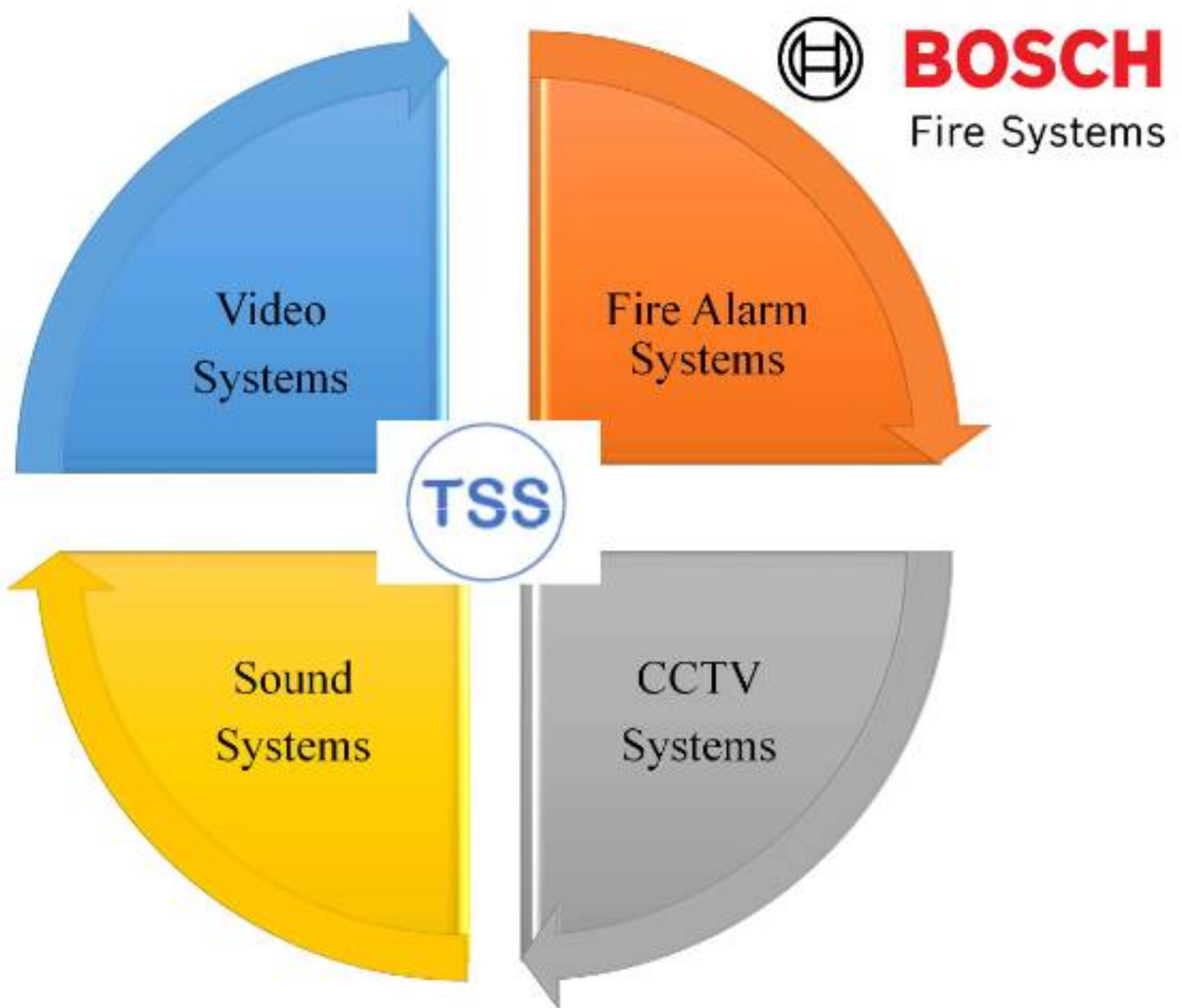
4. West, J., Siddhpura, M., Evangelista, A. and Haddad, A., 2024. Improving equipment maintenance switching from corrective to preventative maintenance strategies. *Buildings*, 14(11), p.3581.

5. Guttikunda, S.K., Dammalapati, S.K. and Pradhan, G., 2025. Assessing air quality during India's National Clean Air Programme (NCAP): 2019–2023. *Atmospheric Environment*, 343, p.120974.

6. Gooroochurn, M., 2024. Mechatronics Implementation of Passive Building Elements to Improve Thermal Comfort and Promote Energy Efficiency in Buildings. In *Artificial Intelligence, Engineering Systems and Sustainable Development: Driving the UN SDGs* (pp. 171-182).

7. Nadweh, S., Mohammed, N., Alshammari, O. and Mekhilef, S., 2025. Topology design of variable speed drive systems for enhancing power quality in industrial grids. *Electric Power Systems Research*, 238, p.111114.

8. Ghosh, C., Chowdhury, A., Mandal, H. and Dutta, H.S., 2025. Energy efficient cascade connected Peltier sensor based air conditioner using liquid coolant heat exchanging methodology and internet of things. *Instrumentation Science & Technology*, pp.1-19.



TOTAL SECURITY SYSTEMS
9911403499 | sales.totalsystems@gmail.com



9. Zou, Y., Zou, W., Chen, H., Dong, X., Zhu, L. and Shu, H., 2025. Research on Real-Time Control Strategy for HVAC Systems in University Libraries. *Applied Sciences*, 15(5), p.2855.
10. Woo, D.O., Jung, W., Menna, J. and Al-Hamando, M., 2025. Streamlining occupant-centric HVAC operations through multi-modal infrared array sensing technology. *Energy and Buildings*, p.116106.
11. Vijayalaxmi, J., 2025. Sustainable Buildings for a Net-Zero India: Developments, Needs, and Challenges. In *Sustainable Building Performance: Towards a Greener India* (pp. 1-22). Singapore: Springer Nature Singapore.

Author



Dr. Hemant Naik is an Assistant Professor in Mechanical Engineering at O. P. Jindal University, Raigarh, Chhattisgarh. He earned his Ph. D. from IIT Madras in thermal and fluid sciences and has served as an Institute Post-Doctoral Fellow at IIT Madras and Research Scientist in South Korea. His research blends computational and experimental approaches in heat transfer, refrigeration, mechatronic control of HVAC systems, CFD, exergy analysis, and solar thermal technologies. With expertise in vortex generators, compact heat exchangers, and sustainable energy devices, Dr. Naik has published widely and reviews for leading journals. His work emphasizes innovation in refrigeration and mechatronic energy systems to advance efficiency and sustainability in line with India's future-ready technological vision.

hemantnaik.29@gmail.com



Dr. Neeraj Kumar Bhoi is an Assistant Professor in the Department of Mechanical Engineering at O. P. Jindal University, Raigarh, Chhattisgarh. He previously served as Assistant Professor in the School of Automation (Mechatronics Engineering) at Banasthali Vidyapith, Rajasthan (2022–2025). He earned his B. E. in Mechanical Engineering (2014) from Bhilai Institute of Technology, Durg, M. Tech. in Production Engineering (2016) from VSSUT Burla, and Ph. D. in Mechanical Engineering from IIITDM Jabalpur. Dr. Bhoi is an academic editor for *Advances in Materials Science and Engineering* and editorial board member of *Scientific Reports* and *Discover Materials*. His research spans microwave-assisted processing, e-waste recycling with mechatronics system integration, and 3D-printed soft actuation. He is a recipient of the 35th MP Young Scientist Award and has published 23 papers, two books, seven chapters, and eight conference articles.



Elevate Your Cleanroom Performance with Our Smart Fan Filter Units (FFUs)

CLEAN AIR. QUIET OPERATION. CONSISTENT PERFORMANCE.



SOLAR CELL



PHARMA



HOSPITALS & LABS



MICRO ELECTRONICS



SEMI CONDUCTOR

Ideal For:

- Solar cell manufacturing units
- Semiconductor & Electronics Manufacturing
- Pharmaceutical & Biotech Cleanrooms
- Medical Device Production
- Research Labs & Hospitals

Key Features:

- HEPA/ULPA Filtration – Removes airborne particles upto .12 microns
- Energy-Efficient EC Motors – Reduce operating costs while maintaining powerful airflow
- Low Noise Design – Operates quietly to maintain a comfortable working environment
- Modular & Scalable – Easily integrates with new or existing cleanroom systems
- Smart Control Options – Monitor and adjust fan speed remotely

Quality You Can Trust. Air You Can Breathe.

Contact us today for a free consultation or quote.

+91 98187 81234 | Ekram.ansari@mechmaark.in

Latest Technology Trends to handle Challenges in Last Mile INTER & INTRA city Cold Chain Supply Management

By: Sanjay Hans

What is Last-Mile Delivery?

The last mile is also known as the final mile or the last part of the supply chain process. This involves the delivery of products from the transportation hub to the end-users. The endpoint of the last mile delivery depends on the type of product like Pharma, Fruits & Vegetables & Dairy Products. For instance, vaccines need to be delivered to vaccination camps where the health personnel can administer them to the patients. Medicines and biologics, on the other hand, need to be delivered to health centres and hospitals for use.



The thing that sets the last-mile delivery of perishable products apart from other forms of distribution is the direct contact with consumers. In the last mile delivery of cold chain medicines, the products are given directly to the recipients and consumers. The last mile delivery starts from the warehouse, after which they are transported to distant locations...

Importance of Last-Mile Delivery

Perishable & Pharmaceutical products are sensitive to light, temperature, humidity, and a host of other factors. In the first leg of the pharma supply chain, these factors are well-controlled as the products are stored in large containers. Even though the first leg is the longest part of the supply chain process, it allows for better monitoring.

Basic Cold Chain Supply Chain cycle



The Challenges for Transit :

1. Logistics of Perishables from Farm to Processing unit – Generally One way commute, which tend to skip this level to save initial cost pressure.
2. Considering importance of Pre-cooling at Farm level specially to maintain F&V quality, its Temperature Controlled transportation becomes even more important to Save Food at this Initial stage of cold chain supply chain.
3. Problem of not getting full load capacity to Refrigerated Trucks due to scattered collection & distribution.
4. Last-mile cold chain delivery faces challenges including temperature control failures, high costs, traffic, limited infrastructure, and lack of visibility , which can lead to spoiled goods and lost customer satisfaction.
5. During Transit... To save Fuel, sometimes Cold cycle may get unwanted gaps.
6. Return Refrigerated Freight consignments not available all the time from Metro cities.
7. Partial small Load deliveries from Distribution centers & warehouse to Super Market & destination sometimes become non viable.



RetroFIT+
for enhanced
comfort and
energy efficiency.

Enhanced carbon reduction, comfort, and safety through field device retrofits.

HVAC renovation projects have the potential to significantly improve occupant comfort and indoor air quality while delivering substantial energy savings.

At Belimo, our decades of retrofit experience along with the reliability and performance of our products make us the ideal partner for customers ready to make simple adjustments to realize immediate results, upgrade with today's technology, or replace their entire HVAC system.

With both standard and custom offerings, we help you find the retrofit solution that's right for you.

Start with
minimal effort
and save up to
20%

Upgrade your
system
and save up to
35%

Make the most
out of it and
save up to
55%



Visit us at
belimo.com/in

BELIMO Automation India Private Limited
BELIMO DESIGN HOUSE
Plot No. R-12, Rabale, TTC Industrial Area, Navi Mumbai, Thane - 400701
E-mail: info.india@belimo.ch

BELIMO

ZECO
Part of Munters

Effortless Comfort, **Sustainable** Impact

Sustainable Engineering

Lower emissions, optimized energy,
built for long-term efficiency.



Advanced Systems

IoT-driven, AI-ready HVAC with
seamless automation integration.

Expert Workforce

Certified engineers delivering
precision design & installation.

Serving Key Segments

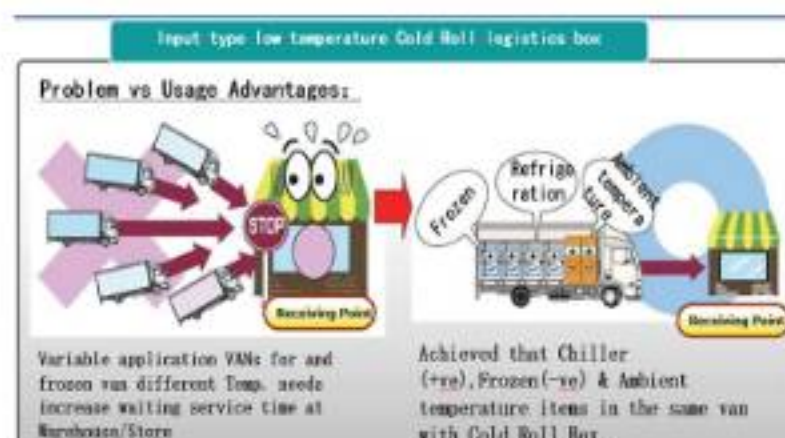


8. Mixing of Dry & Temperature controlled for common point delivery can cause gaps in Cold Chain Cycle, which can cause quality deration.
9. On Road Field service of Refrigeration system during sudden breakdowns of Refrigerated Trucks/Vehicles is very critical & almost impossible sometime, since such vehicle need to reach workshops....Waste of Time, Fuel & Risk of Food spoilage.
10. Temperature Control within range depends on running of refrigeration system even for waiting/ No Entry/Traffic Jam situation.
11. 2-way (To-Fro) customers & return fare is very difficult to get for refrigerated vehicle. Due to which Cost & viability is an issue.
12. Dependability on Drivers for final product quality for FG perishables.
13. Serviceability of such transport refrigeration system across Tier-B & C cities is a challenge.

The Solution Concept – COLD ROLL BOXES for Last MILE Delivery

Solutions involve advanced route optimization software, real-time temperature monitoring technology, smart packaging solutions, investing in temperature-controlled vehicles, improving driver training, and leveraging micro-fulfilment centres to reduce delivery times and ensure product integrity.

So Lets understand the latest Technology Trend for Cold Chain Logistics..... The Cold Roll Logistics Boxes.....



COMPONENTS of COLD ROLL BOX Concept

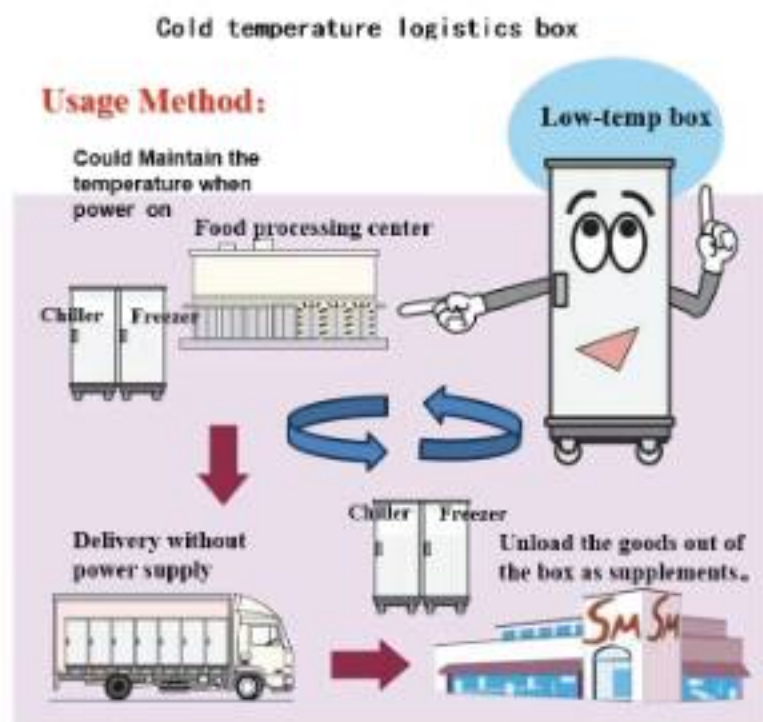


The Final Transit journey with Cold Roll Boxes begins...



Satisfied the requirements (more variety of products of less quantity) from Cold Chain processing center to different stores with different points of sale that helps to reduce load of inventory in Quick Commerce Dark Stores/QSRs on daily basis

Achieved that Chilled/Frozen & Ambient temperature stuff in the same van



SOLUTION ADVANTAGE & BENEFITS of COLD ROLL BOX Concept

Less investment

Refrigeration and ambient temperature in the same van, low cost and efficiency space utilization ;different temperature in the same van , good temperature management

Easy to use

Freezer is movable and easy to load ,also it can avoid mistake and save time.

Low operating and maintenance costs

No need to maintain before using, non-toxic, anti-friction, high strength material with efficient environmental protection refrigerant.



Precision Airflow for the World's Critical Environments



Our Phone Number
+91 9625205446



Visit Our Website
www.truestarairsystems.com



Corporate Office

Riana Aureus Towers, Plot No 51-52, 6th Floor,
Sector 136, Noida, Uttar Pradesh 201304

SAMPLE ILLUSTRATION OF ENERGY SAVING WITH COLD ROLL BOXES vs REF. VAN



Assume, if it costs 5 hours to finish a one-way delivery, it has five distribution stations, each one unload 20 minutes, one hour-traffic jam.

The cost of a 4.2 meter refrigerated van (one)		The cost of a 4.2 meter van with a box (one)	
Fuel consumption a hour when operating	2L/hour	The power of the coolant freezer	1.2kw
Fuel consumption a hour when waiting	2L/hour	8 boxes need 2 freezers	2 sets
Running time of the van	2.3hours	The effective running to cool the coolant (considering +38Ambient)	16hours
Loading time of the van	1.7hours	Electricity bill	INR8 /KWH
The time of traffic jam	1hour	Method1:Refrigerated van	
Unit price of the fuel	INR90/L	Method2:Normal van + logistics box	
The fuel consumption totally (Approx.)	9-10L	TOTAL power consumption	38.4kwh
Total cost	INR 800 to900	Total cost of power	INR384

Comparison of Refrigerated VAN and COLD Temperature Logistics Box

Item	Refrigerated van	Low temperature logistics box
Insulation performance	Good. It could maintain the temperature in normal condition. But when it comes to traffic jam, the engine need to run continuously to maintain the temperature. If transport to near destination, open the frequently may cause temperature fluctuation and affect the insulation performance.	Better. Different goods in different boxes, the logistics box itself has protective layer and better insulation stability. It won't lose the temperature too much during the traffic jam and loading. Especially it can maintain food like meat and seafood, because the temperature is the key to transport the goods.
Operating costs	Very high. One refrigerated van could transport low temperature level goods. It will waste the power and space of the van if the goods need to be set the lowest temperature.	Very low. It could transport different temperature goods at once. Also it could adjust the number of boxes according to the quantity of goods, it could save the power and space and has a better utilization rate.
Refrigeration method	Complex. The detached refrigerated van is powered by a separated fuel supply compressor, the non-detached is powered by electric engine supply compressor.	Easy. Each box has its own compressor unit/system. Could use cold storage also to maintain temperature or backup power before start of Van.
Maintain costs	High. As the compressor and the van is designed in a whole set, so if any of them is damaged, you need to maintain them both. It will cost a lot as the compressors are special.	Low. As the box has its own compressor, so you could just repair the compressor and the box is simple to control. Also the cost is much lower & its CBU/Compressor are easily available being standard system.

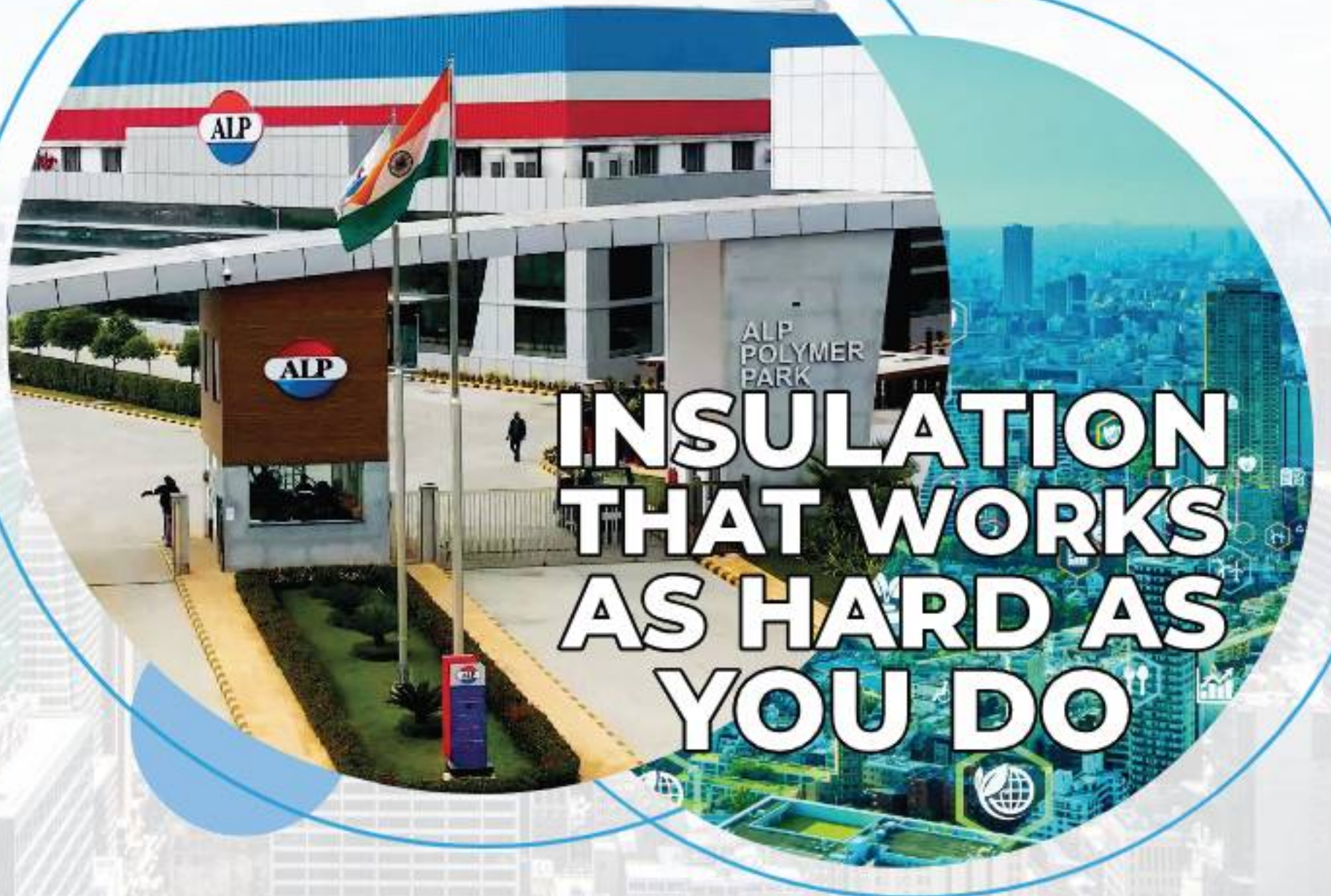
Item	Refrigerated van	Low temperature logistic box
Use convenience	Complex. Need to use different tools to operate the goods and cost too much time and manpower. During transit and load, need to clean the van regularly.	Convenience. Every goods has its own box, every box has steel, wood, etc. easy to move and use. A cost too much time and manpower. Also it won't pollute the van.
Environment protection	Increase the pollution. according to the server, the pollution will increase 30% when add the compressor, and the status low is the van, it can save before you transport with overloading and it do harm to environment. Even in NO EXHIBITION cases, it will impact.	Control the pollution effectively. Besides the fuel power, it could reduce the noise according to the goods, as it could save the costs. So need to maintenance is No Entry Restriction & loading time.
Safety factor	Low. It will damage the goods and the van if there is an accident or the fault of the placing the goods.	High. The goods could be closed tightly and the box itself has the protection. So if there is an accident, it will reduce the costs of the clients.
Energy	Depend on the using method of the clients.	Depend on using the method of the clients. the advantage of the box are that it could use the different goods and you could reduce the box according to the quantity of goods.

Author

Brief Profile of Article Writer in Ref & Cold Chain



Presently working as HEAD – Engineering & Product Management in COLD CHAIN Division at PANASONIC INDIA at Head Office, Gurugram. He is having an overall rich experience of **25 years plus** in the growing field of Refrigeration, Cold Chain & Air-conditioning field in various key functions like Project Design, Project Sales & Management, Technical Services & consultancy, R&D, Training & Customer Services for HVACR field. He has also worked in various esteemed HVACR companies like Emerson, Blue Star, Daikin, Carrier/Haier, Ingersoll Rand & Tecumseh. He did B-Tech-Mechanical with Specialization in Ref & Airconditioning from YMCA Faridabad & MBA in Marketing Management from Kurukshetra University". He is a proud member of ISHRAE-Gurugram Chapter & served in various capacities like Refrigeration Chair, Chapter President, IRC & Research committee at ISHRAE.



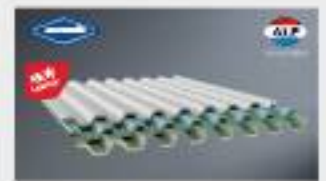
INSULATION RANGE
EPDM | SILVER CLAD |
EXOFOAM | UPVC CLAD |
AFLEX ECO



ACOUSTIC RANGE
ACCSOUND | ACCOFOAM |
ACCSOFS | UNDERLAY



**TAPES &
ACCESSORIES**



**FIRST EVER HIGH STRENGTH
ENERGY SAVING
ROOF & WALL PANELS**

Protecting Your Comfort
Preserving the Planet

ALP AEROFLEX INDIA PVT. LTD.

Corporate Office: Plot No. 32, Sector-18 HUDA,

Gurgaon, Haryana - 122015 (INDIA)

+91-124-4731500 marketing@alpaeroflex.com www.alpaeroflex.com

| AEROFLEX[®] | AEROCELL | Aflex-ECO | EXOFOAM

Program & Events



Half Day Workshop on Low Carbon Buildings & the Way Forward was held on 12th July 2025 @DCI Saket Office. The program was attended by 14 members and 6 non-members



TECHNICAL WORKSHOP

Full Day Technical Workshop was held on 17th July 2025 @CPWD, Ghaziabad. The program was attended by 30 non-members



Full Day Technical Workshop was held on 18th July 2025 @CPWD, Ghaziabad. The program was attended by 15 non-members



DISTINGUISHED LECTURE

Thermal Insulation system for Energy Efficient Green Buildings - Pathway to De Carbonisation was held on 17th July 2025 @CPWD, Ghaziabad. The program was attended by 30 non-members



Field Measurements & Data Storage in HVAC was held on 08th August 2025 @DCI Office, Saket. The program was attended by 12 members and 11 non-members



COMPLETE RANGE OF AIR DISTRIBUTION PRODUCTS

BALANCE[®]



Balance Air Equipments Private Limited

Plot No. 708-709, Sector 2, IMT Bawal, Distt. Rewari, Haryana -123501 (India)

Mob.: +91 9315177701 | E-mail : info@balanceair.net, sales@balanceair.net | Website : www.balanceair.net

Half Day Workshop on Live Safety and MEP-NBC and Global Codes was held on 19th July 2025 @GMR, Gurugram. The program was attended by 58 non-members



ICP-Essentials of HVAC Drafting was held on 17,18 & 19th July 2025 @DCI Office, Saket. The program was attended by 23 non-members



ISHRAE KNOWLEDGE TALK

IKT on Latest design trends in Switchgear & Controlgear technology & a brief overview of IEC standards for Panels was held on 25th July 2025 @DCI Office, Saket. The program was attended by 7 members and 4 non-members



IKT on Sustainable Cooling for Energy Efficient Buildings was held on 29th July 2025 @DCI Office, Saket. The program was attended by 5 members and 4 non-members



National Program was held on 22nd August 2025 @Crowne Plaza, Mayur Vihar. The program was attended by 36 members and 27 non-members





Frick India Limited

An industrial refrigeration equipment
manufacturer and complete turnkey solutions
provider since 1962



Visit us: www.frickweb.com



K-FLEX® TITAN™

- ▶ Ultimate VRV/VRV Pipe Insulation
- ▶ UV / Weather Resistant
- ▶ Highly Flexible
- ▶ Quick Installation

ASTM E84 25/50-rated For Jacket
BS 476 Part 6 & 7 for Core
UL - 94 For core
Self Extinguishing, Does Not Drip
Low Thermal Conductivity
UV Resistance -ASTM-G153



**K-FLEX®
TITAN™**
THIS CHANGES
EVERYTHING.



K-FLEX

K-FLEX India Pvt. Ltd
707, 7th Floor, Sahakar Building, G-Wing,
21, Sion Road, Pune - 411001
MAHARASHTRA INDIA
T 020-67246 200
E inquiry@kfex.com

www.kfex.com/hin

K-12 ACTIVITY



Neon Party was held on 2nd August 2025 @South Extension, New Delhi. 80 people participated in the event



On the occasion of Independence Day, Freedom Fighter Slogan Competition was held on 13th August 2025 @MCD School, Neb Sarai. 40 people participated in the event



On the occasion of Independence Day, Freedom Fighter Slogan Competition was held on 13th August 2025 @MCD School, Neb Sarai. 40 people participated in the event

Advocacy Program was held on 30th August 2025 @Bharat Mandapam. The program was attended by 25 members and 35 non-members





Clean Air
Through Technology

**MechEasy
GREEN PIR PANEL**



MechEasy™

Green PIR Panel

Pre insulated ducting

**MechEasy
GREEN PIR PANEL**
Pre insulated ducting

SERVICES



1

We are providing CAD to CAD solutions for all our customers with the qualified young professionals and training team to give complete technical assistance.



2

We also mold localizable quantities of required panels in accordance for clients who require delivery for the given quantity.



3

We have more than 100 trained in professional fabrication for all kinds of turning, fabrication, installation & after sales services.



4

On-site start fabrication the local fabricated at the site as per the manufacturing with special tools.

5

CHC Machine: For urgent projects in the help of a CNC cutting machine, we can provide Pre-cut Panels to reduce the time of construction of ducts at the site and also complete the flange and duct fabrication from our plant to site for head height and connection, which is done the time by 70%.



Mechmaark Industries Pvt. Ltd.

Unit No. 609-610, 7th Floor, West End mall, Janakpuri, New Delhi-110058

Contact us: +91 8377004982 | Email: mecheasy@mechmaark.in

www.mechmaark.in

YOUTH ISHRAE

Half Day Workshop on Youth International Day was held on 14th August 2025 @Park inn by Radisson. The program was attended by 16 members and 15 non-members



Half Day Workshop on The Power of Zero: Designing for a Regenerative Future was held on 14th August 2025 @Park inn by Radisson. The program was attended by 16 members and 15 non-members



STUDENT ACTIVITY

A Technical Talk for Electrical students was held on 29th August 2025 @NIET College. The program was attended by 100 non-members



A Technical Talk for Mechanical students for was held on 29th August 2025 @NIET College. The program was attended by 25 members and 35 non-members



New Members List for I-SHARE

S. No.	Member Name	Company Name
1	Pradeep Yadav	Delhi Technological University
2	Teer Karan Singh	Super Tech Pumps & Equipments Pvt. Ltd.
3	Yuvraj Arora	Armacell India Pvt. Ltd.
4	Vipin Singh Chauhan	Armacell India Pvt. Ltd.
5	Nitin Kumar	Indotech Engineering Products
6	Manoj Kumar	Bigman Refrigeration Pvt. Ltd.
7	Jatin Masrani	EASCO Fasteners
8	Sanjay Kumar Varshney	Signature Global
9	Kavita Bamotra	Avantec Aircon Pvt. Ltd.
10	Amrita Singh	Avantec Aircon Pvt. Ltd.
11	Aniket Sharma	Total Security Systems
12	Pummy Sharma	Total Security Systems
13	Neha Anand	Zeco Aircon Limited (A Munters Group Company)
14	Srinivasan Vijayaraghavan	Zeco Aircon Limited (A Munters Group Company)
15	Arjun Singh	Truestar Air Systems
16	Shaurya Aggarwal	Truestar Air Systems
17	Khurshid Usmani	TRANE
18	Dr. Kaukab Naaz	LIMRA Consulting Engineers
19	Dr. Affan Sami Rayeen	Fortis Escorts Hospital
20	KS Prajapati	Roshan Real Estate Pvt. Ltd.
21	Divyansh Sati	Advance Valves Pvt. Ltd.
22	Sridhar Kusuma	Siddharth Engineers
23	Jitendra Kumar Srivastava	National Productivity Council
24	Deepak Kumar Malik	Kumaran Engineering (Bhopal) Pvt. Ltd.
25	Ashish Aggarwal	Narendra Flexipack Co. Pvt. Ltd.

S. No.	Member Name	Company Name
26	Rahul Bhat	
27	Mohammad Zahid Ansari	O ₂ Power
28	Zohaib Khan	HVAC Service Provider
29	Ashok Kumar	Testo India Pvt. Ltd.
30	A Anbuselvan	CPWD
31	Irphan Ali	Greenoz Cooling System Pvt. Ltd.
32	Anas Khan	Greenoz Cooling System Pvt. Ltd.
33	Reena Kumari	ALP Aeroflex India Pvt. Ltd.
34	Poonam Rajouria	ALP Aeroflex India Pvt. Ltd.
35	Masoom Raza	ALP Aeroflex India Pvt. Ltd.
36	Hitesh Chhabra	ALP Aeroflex India Pvt. Ltd.
37	Anwar Ahmad	Alfalah University
38	Aftab Alam	Limra Design Solutions
39	Praveen Kumar	Honeywell Automation India Limited
40	Sandeep Kumar	Kirloskar Chillers Pvt. Ltd.
41	Anjul Manchanda	Arctic Refrigeration Pvt. Ltd.
42	Md. Peshe Anwar	Hira Technologies Pvt. Ltd.
43	Ambrish Kumar Parashar	Testo India Pvt. Ltd.
44	Vikrant Malhotra	Zhejiang Extek Technology Co. Ltd.
45	Chandresh Kumar	NBCC India Limited
46	Ramana Rahul Joshi	Studio Golden Grass
47	Gurvinder Singh Vartiya	Thermal Comfort
48	Sandeep Chauhan	Apex Aircon Services
49	Upendra Singh	Paramount Polytreat Chemicals Pvt. Ltd.



ISHRAE

Delhi Chapter

Presenting Partner



DCI CUP 2025



Inauguration & League Matches :- 1st 2nd Nov 2025

Final Match :- 8th Nov 2025

Venue :- Wisteria Sports Club, Gurugram

**WINNING TEAM WILL GET ONE
BMW BIKE**



Mr. Tapas Kushwaha +91 7982623229 / Mr. Arvind Kumar +91 9205780208
Ms. Reena Bahuguna +91 9205780211